Sub A1

PATENT CLAIMS

1. Illumination system, particularly for lithography with wavelengths of ≤193 nm comprising

1.1 a first optical element, which is divided into first raster elements and lies in a first plane, whereby said plane defines an x-direction and an y-direction, whereby

1.2 the images of the first raster elements superimpose in an object plane of the illumination system and

1.4 the first raster elements each have an x-direction and a y-direction with a aspect ratio,

characterized in that

1.5 at least two raster elements each have a aspect ratio of different magnitude.

2. Illumination system according to claim 1,
further characterized in that
the illumination system comprises a second optical element, which is divided into second raster elements, whereby a second raster element is assigned to a first raster element and whereby at least one second raster element has an anamorphotic optical effect.

3. Illumination system according to claim 2,
further characterized in that
a field with a field aspect ratio is illuminated in the object plane of the illumination system and at least some of the second raster elements have an anamorphotic optical effect, which is selected such that the aspect ratio of the images of the first raster elements is substantially the same in the object plane, independent of the aspect ratio of the first raster elements.

4. Illumination system according to one of claims 1 to 3,
further characterized in that
at least one of the at least two first raster elements with aspect ratios of different magnitude has an anamorphotic optical effect.

Subd7 5. Illumination system according to one of claims 1 to 3,
further characterized in that
the at least two first raster elements with aspect ratios of different magnitude have an isotropic optical effect.

6. Illumination system according to claim 5,
further characterized in that
the first raster elements have an isotropic optical effect.

7. Illumination system according to one of claims 1 to 5,
further characterized in that
those first raster elements that have an anamorphotic optical effect are cylinders and/or toroids.

8. Illumination system according to one of claims 1 to 7,
further characterized in that
those second raster elements that have an anamorphotic optical effect are cylinders and/or toroids.

9. Illumination system according to one of claims 1 to 8,
further characterized in that
all of the first raster elements are completely illuminated in the first plane.

10. Illumination system according to one of claims 1 to 9,
further characterized in that
the illumination system has a collector unit, which illuminates the first plane with the first raster elements.

11. Illumination system according to one of claims 1 to 10,
further characterized in that
the illumination system has at least one field mirror.

12. Illumination system according to claim 11,
further characterized in that
the second raster elements and the at least one field mirror image the assigned first raster elements in the object plane of the illumination system.

13. Illumination system according to one of claims 1-12,
further characterized in that
the first raster elements are rectangular.

14. Illumination system according to one of claims 1-13,
further characterized in that
the field to be illuminated in the object plane of the illumination system represents a segment of a ring field.

15. Projection exposure system for microlithography with

15.1 a illumination system according to one of claims 1 to 14 with an exit pupil (112), which partially collects the emission produced by a light source (100) and further guides it to illuminate a field in the object plane of the Illumination system

15.2 a pattern-bearing mask, which lies in the object plane (114) of the Illumination system

15.3 a projection device, particularly a projection objective (126) with an entrance pupil, which coincides with the exit pupil (112) of the Illumination system, whereby this projection objective images the lighted portion of the pattern-bearing mask in an image field of the projection device

15.4 a light-sensitive substrate (124), which lies in the plane of the image field of the projection device.

16. Method for producing microeletronic components, particularly semiconductor chips with a projection exposure system according to claim 15.